

UTILITIES

This section addresses the critical utilities of electrical power, gas and oil, and water (drinking and wastewater). Telecommunications is discussed separately in another section of this report.

ELECTRIC UTILITIES

The Committee continues to view electric utilities as its top priority because of their critical importance. Understandably, the single biggest concern of both individuals and corporations is whether the lights will stay on.

Background and Vulnerabilities

There are approximately 3,200 electric utilities in the U.S., including

- 250 investor-owned or private utilities;
- 10 government-owned utilities;
- 2,000 publicly owned utilities; and
- 900 rural cooperatives.

Nearly 80% of the nation's power generation comes from the 250 investor-owned utilities. The federal government generates another 10% of the nation's power, primarily through large facilities such as the Tennessee Valley Authority and the Bonneville Power Administration. There are another 2,000 non-utilities, or privately owned entities, that

generate power for their own use and/or for sale to utilities and others. Electric power is generated from the following sources: 51% by coal; 20% by nuclear energy; 15% by gas; 10% by hydroelectric sources; and 4% by other sources.

The electric power industry is complex and highly automated. As depicted in Figure 1, the industry is made up of an interconnected network of generation plants, transmission lines (commonly referred to as the "grid") and distribution facilities responsible for providing electricity from the grid to every household and company in North America.

The North American Electric Reliability Council (NERC), through its 10 regions (as shown in Figure 2) and 130 power control areas, is responsible for managing the transmission and distribution of power throughout North America.

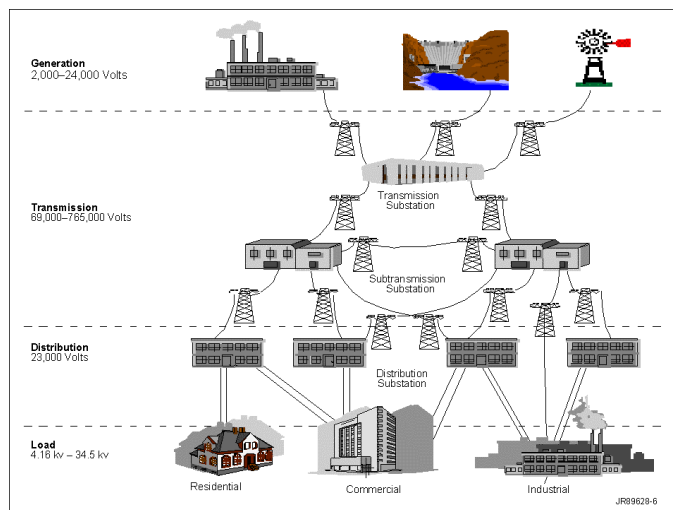


Figure 1: Electric Power Components

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There are three “grids” in North America: the western interconnect or WSCC region, the Texas interconnect or ERCOT region, and the eastern interconnect encompassing the other eight regions.

In a simplified explanation, each grid operates as a single machine, constantly making adjustments to balance the amount of power being generated with the amount being used. These adjustments are critical because electric power cannot be stored. Too much power could literally melt transmission and distribution lines if circuits are not broken in time; too little power could result in brownouts.



Figure 2: NERC Regions

ECAR – Eastern Central Area Reliability
ERCOT – Electric Reliability Council of Texas
FRCC – Florida Reliability Coordination Council
MAAC – Mid-Atlantic Area Council
MAIN – Mid-America Interconnected Network
MAPP – Mid-continent American Power Pool
NPCC – Northeast Power Coordinating Council
SERC – Southeast Electric Reliability Council
SPP – Southwest Power Pool
WSCC – Western System Coordinating Council

In addition to the computer systems used for record keeping and billing, it takes a high degree of automation to operate the grid—power control systems, energy management sys-

tems, supervisory control and data acquisition (SCADA) systems, telecommunications systems, and substation control systems.

On the one hand, this high degree of interconnectedness gives the grids unprecedented reliability and efficiency. On the other hand, this very interconnectedness makes the grid fragile and susceptible to Y2K disruptions. An outage in one part of the grid can cascade, causing ripple effects on other parts of the grid. As an example, a generation plant that goes out in Maine could affect power in Florida.

Left unaddressed, Y2K anomalies could lead to the malfunction of software programs on mainframe computers, servers, personal computers, and communications systems. Corrupted data could be passed from one application to another, causing erroneous results or shutdowns. This means that computer programs used for accounting, administration, billing, and other important functions could experience problems.

Of greater concern to the electric power industry are embedded computers—small electronic chips or control devices. These chips are used extensively in all parts of the electric power industry, including generating plants, transmission lines, distribution systems, and power control systems. Even though only a small number of these embedded devices will have a Y2K problem, it is impossible to tell which will malfunction until each chip has been

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checked and tested—a time-consuming venture.

What is Being Done?

Several federal organizations have responsibilities for the electric power industry. Primary among them are the Department of Energy (DOE), which is charged with formulating a comprehensive energy policy that encompasses all national energy resources, including electricity, and the Nuclear Regulatory Commission (NRC), which is responsible for ensuring the safety of all 103 nuclear power electric generating plants.

At DOE's request, NERC—a non-federal entity—has assumed the primary role in monitoring the overall Y2K preparedness of the electric power industry. NERC is a logical choice for this role because it is the organization most involved in keeping the lights on in North America.

Other significant Y2K players in the electrical power industry include:

- American Public Power Association (APPA);
- Electric Power Research Institute (EPRI);
- National Rural Electric Cooperative Association (NRECA);
- Edison Electric Institute (EEI);
- Nuclear Energy Institute (NEI); and
- Canadian Electric Association (CEA).

NERC conducts monthly Y2K status surveys of the bulk power producers; provides a quarterly summary of Y2K status information from the above

entities representing all of the nearly 3,100 utilities; and reports the results to DOE.

NERC held conducted a major drill of the midnight rollover from September 8 to September 9 in a simulation of the rollover to January 1, 2000. NERC estimated that between 400 and 500 of the over 3000 utilities in North America participated in the drill. According to NERC, the drill simulated various communications and power control system failures, and demonstrated the ability of power industry personnel to deal with these problems.

The Committee has encouraged the NRC to add operational issues for Y2K purposes to its responsibility for U.S. nuclear power plant safety. NRC required each plant to submit a report by July 1, 1999, to confirm that the facility is Y2K ready, or will be ready, by the Year 2000. NRC then conveyed the results of these reports to NERC for inclusion in its August 1999 report.

In keeping with the top priority given to utilities, the Committee's first hearing on June 12, 1998 was on the energy utilities. The Committee received testimony from Administration and industry officials. The hearing was instrumental in heightening awareness and motivating all segments of the industry to action.¹

Committee staff has worked closely with DOE and NERC to keep abreast of the preparedness of the electric power industry. On August 4, the Committee held a virtual hearing (electronic testimony only) to pro-

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vide an update on the status of this important industry.²

Status

In June 1998, the Committee was concerned that, while most electric utilities seemed to be proceeding in the right direction, the pace of their remediation efforts was too slow. On September 17, 1998, three months after the Committee's hearing, NERC issued its first comprehensive report on the electric power industry to DOE. It has issued three quarterly updates since that time, the last of which was on August 3, 1999.

Progress by the electric industry over the past 15 months has been remarkable. About 99% of the 3,088 electric supply and delivery organizations have participated in NERC's assessment process. Distribution entities, or actual electric utilities, have participated in the NERC process by responding to data gathered by APPA and NRECA and by providing it to the appropriate bulk electric operating entity. NERC's overall survey results are shown in Figure 3.

Overall progress in the electric utilities industry has been most impressive, moving from 36% of testing complete as of the Committee's last report to 99% complete at the time of this report. However, only about

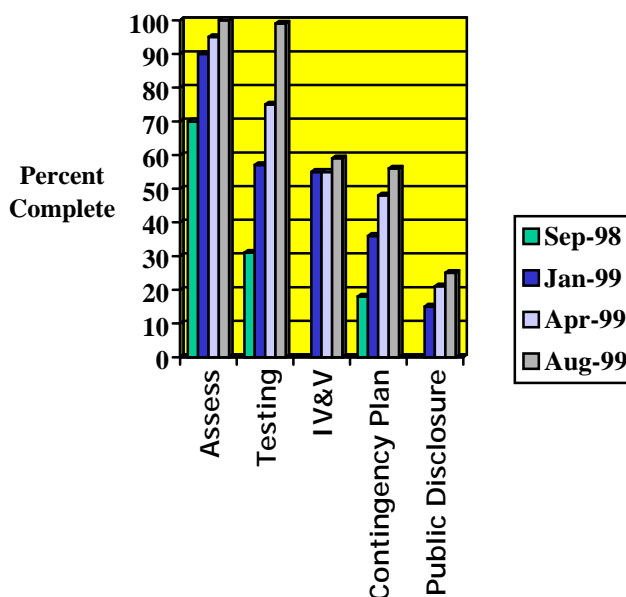
60% of the companies are using independent review to validate and confirm their results. In addition, fewer than 60% have developed contingency plans, and fewer than 25% have actually tested or exercised these plans. Equally troubling is the fact that only about 24% of the companies are publicly disclosing their reports to NERC. Finally, and most alarming, is the fact that 270 of the 2,012 public power utilities, including some serving large metropolitan areas, did not participate in APPA's June survey and were, as a result, not included in NERC's August 1999 report.

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--SENATOR BENNETT

Although nuclear plants are addressed in the overall NERC study, public concern about their safety

**Figure 3 - Y2K STATUS OF ELECTIC
POWER INDUSTRY**



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dictates that the Committee provides specific information about the overall Y2K preparedness of these plants.

In general, nuclear facilities contain very old analog technology and, accordingly, have fewer Y2K issues than the more digital and modern fossil fuel facilities. Nevertheless, assessments to date have revealed varying degrees of problems in areas such as plant process control, feed water monitoring, refueling, turbine control, and building security and access control.

These problems should not affect plant safety but they could cause electricity production problems. Based on NRC's reports from the 103 nuclear plants and testimony from the NRC Chairman at the Committee's August 4, 1999 hearing, 73 (71%) plants have completed all remediation and are Y2K ready. Of the 30 plants with work remaining, 6 will not be prepared for possible Year 2000 computer problems before November 1.

The two D.C. Cook plants in Berrien County, Michigan will not be Y2K ready until after November 1, and will remain shut down during the Y2K transition. The plants are in the midst of an extended shutdown, and have Y2K readiness deadlines of December 15.

Four other plants with November-or-later deadlines will require outages

to complete Y2K activities. Those plants are: Brunswick Unit 1 near Wilmington, North Carolina; Comanche Peak Unit 1 in Somervell County, Texas; Salem Unit 1 in Salem County, New Jersey; and Farley Unit 2 near Dothan, Alabama, which has a December 16 deadline.

In addition, 15 plants have late October deadlines: Browns Ferry Units 1 and 2 near Decatur, Alabama; Comanche Peak Unit 2 in Somervell County, Texas; Diablo Canyon Units 1 and 2 near San Luis Obispo, California; Hope Creek in Salem County, New Jersey; North Anna Unit 2 in Louisa County, Virginia; Peach Bottom Unit 3 in York County, Pennsylvania; Salem Unit 2 in Salem County, New Jersey; Sequoyah Units 1 and 2 near Chattanooga, Tennessee; South Texas Project Units 1 and 2 near Matagorda, Texas; Three Mile Island, near Harrisburg, Pennsylvania; Vermont Yankee in Vernon, Vermont; and Watts Bar in Rhea County, Tennessee.

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-- SENATOR DODD

The NRC released a report on September 7, 1999 stating there were no Y2K safety concerns at the 103 plants. However, the report mentioned that Nebraska's Cooper Nuclear Station had discovered, in an audit, that its contractor improperly addressed three pieces of equipment. Further scrutiny revealed that the licensee had not completed its integrated contingency plan by the July 1, 1999 deadline,

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although it had claimed Y2K readiness.

Expectations

Overall failure of the electric power grids and prolonged blackouts are highly unlikely, not only because of the interconnected nature of the grids, but also because peak demand during the winter months will only be about 55% of the electric generation capability. Simply stated, this means that even if 45% of the generation capability is lost—a highly unlikely scenario—there would still be enough electric power available to meet the demand.

Notwithstanding this reassuring fact, the Committee continues to believe that local outages are a distinct possibility. Many electric utilities will not complete their remediation activities until later in the year. This reduces their opportunity to participate in industry readiness exercises and limits their time to address unexpected failures.

Concerns

- The more than 3,000 electric utilities are at various stages of remediation. The likelihood of an outage in a given area is directly related to the overall preparedness of the specific electric utility serving that area. Individual utilities must do a better job of telling the public about their overall level of readiness. According to NERC's last report to DOE, 75% of the utilities do not routinely share detailed readiness information with the public.
- There are no comprehensive studies concerning the number of entities that would have to fail to put the grid at risk, but some experts suggest that it may be a very small percentage if these failures occur in key locations. As a precaution, NERC regions and power control areas should ensure that no such "choke points" exist in their areas of responsibility.
- The interrelationship of the electric power sector with other sectors it depends on—telecommunications, natural gas and oil supplies and pipelines, and rail transportation for coal supplies—requires close coordination. This coordination currently exists and must continue to ensure contingency plans are viable.
- The bulk power entities have spent vast amounts of money and most are Y2K ready. However, some distribution utilities may still be lagging behind in their Y2K preparations. Fueling the Committee's concern is the fact that more than 200 public utilities did not participate in NERC's most recent survey.
- State public utility commissioners should continue to ensure that electrical utilities under their purview are taking appropriate Y2K remediation, risk reduction, and contingency planning actions. They should also keep the public informed about the status of these utilities.

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- NRC must remain vigilant over all 103 nuclear power plants, particularly the 20 that have Y2K readiness dates in the fourth quarter of this year. Unless nuclear licensees have fully tested and audited safety and operational systems, there is some concern that unexpected problems will trigger untested, as of yet, contingency plans.

OIL AND GAS UTILITIES

Oil and gas utilities are vital to Americans. Oil provides about 40% of the energy Americans consume, including home heating. Approximately 60 million American homes and businesses use natural gas for heating, cooking, and other applications.

Background and Vulnerabilities

The oil and gas sectors face a variety of Y2K problems in their administrative systems, as well as in the microprocessors, controllers, and other computer chips embedded in the production, transportation and distribution systems used in this industry.

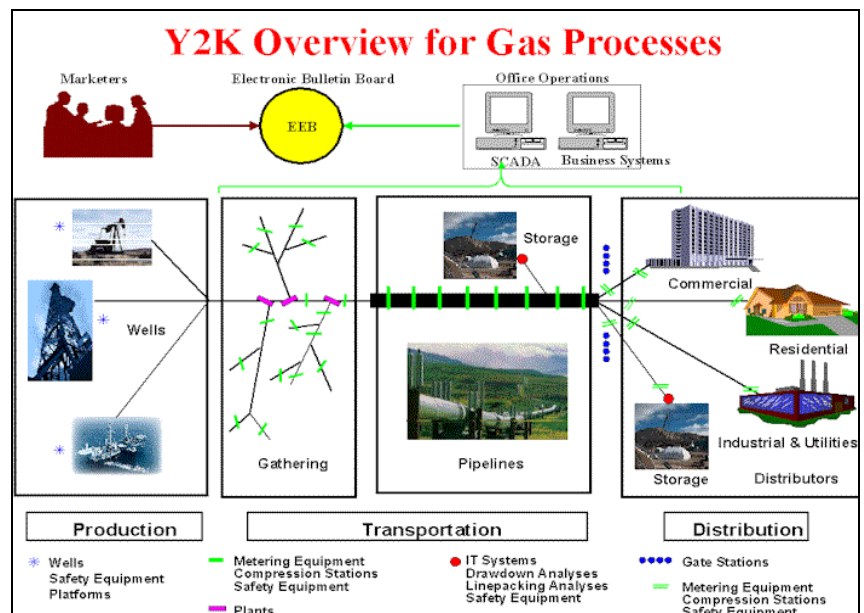
Automation—which raises Y2K concerns—is prevalent throughout both the gas and oil industries. The diagram shown in Figure 4 shows the

elements and processes of gas and oil production, transmission, and distribution that must be checked for Y2K problems.

Natural gas comes through a 1.3 million-mile underground system. The U.S. has about 58,000 miles of gathering lines in the gas production areas; 260,000 miles of long-distance pipelines; and nearly 1 million miles of distribution lines operated by local gas utilities. All of these must be checked for Y2K problems.

Thousands of embedded systems in millions of miles of pipelines must all be checked and, if necessary, replaced. Vulnerable systems include distribution control systems, programmable logic controllers, digital recorders, control stations, recorders, meters, meter reading and calibration software, and SCADA. Personal computer-based applications such as control and work

Figure 4



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management software within a utility may also possess Y2K vulnerability. Any date-dependent application, system, or component may experience problems that result in complete system or station shut-down.

Similarly, oil pumping, transportation, refining and, to an ever-increasing extent, gas stations are extremely dependent on technology. Many oil and gas platforms are self-contained facilities and depend on a range of computer-related equipment for their operations.

Tankers used to transport oil from overseas depend on reliable on-board navigation, communication, and safety systems. Both shipborne and portside cargo handling equipment required to deliver petroleum and petroleum products are highly automated. These elements are critical because about 55% of the oil consumed in the U.S. comes from foreign sources.

Refineries that convert crude oil into useful products such as gasoline are highly automated. Even gas stations use computer and communications equipment to verify customer payments. The Y2K preparedness of the refineries is particularly critical. Even though there is in excess of a two-month supply in the U.S. strategic petroleum reserve, there is only about a 3-5 day supply of finished product available on any given day.

The electric and the oil and gas sectors are also highly interdependent. The electric sector depends on oil and natural gas to fuel production plants. The oil and gas sector depends on electricity to power its control centers, business functions, and marketing and sales. Both sectors are also heavily dependent on the telecommunications and transportation sectors to move oil and gas from production areas to end users nationwide.

What is Being Done?

The Federal Energy Regulatory Commission (FERC) has responsibility for monitoring the preparedness of the gas and oil sector. Other federal agencies involved in this sector include DOE, the Department of Transportation (because pipelines are a form of interstate transportation), the Department of the Interior, and the General Services Administration.

Trade associations representing the various gas and oil entities are also playing a key role in Y2K remediation efforts for this industry.³

The Committee has held three hearings addressing oil and gas issues. The first hearing, on June 12, 1998, better defined the Y2K problem in the gas and oil sector, heightened awareness, and mobilized an industry that was not yet fully engaged in addressing the Y2K problem. This hearing also motivated the President's Y2K Coun-

A barrel of crude oil (42 gallons) is refined into:

<u>Product</u>	<u>Gallons*</u>
Gasoline	19.5
Fuel oil	9.2
Jet fuel	4.1
Residual fuel	2.3
Liquefied gas	1.9
Still gas	1.9
Coke	1.8
Asphalt	1.3
Petrochemicals	1.2
Lubricants	0.5
Kerosene	0.2
Other	0.3

*Totals more than 42 gallons due to processing gains.

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cil to create an oil and gas working group. The kick-off meeting for the oil and gas group was held at FERC in June 1998. FERC has held numerous working group meetings since that time and, until recently, made its meetings and other proceedings and events publicly available on its Web site.

The American Petroleum Institute (API), a national trade association representing all aspects of the oil and gas industry, provides direct assistance to FERC in managing the working group. In 1997, the API formed a Year 2000 Task Force to facilitate Y2K readiness across the petroleum industry. The Task Force currently represents more than 50 industry companies and meets every 6-7 weeks.

On April 22, 1999, the Committee held a hearing on oil imports. The hearing highlighted the strategic importance of the Y2K preparedness of oil-producing countries, as well as the Y2K vulnerabilities those countries face.⁴

On August 4, 1999, the Committee held a virtual hearing (electronic testimony only). The primary purpose of this hearing was to allow industry witnesses to describe their current state of readiness.

The American Gas Association (AGA)--a trade association of almost 300 natural gas transmission, distribution, gathering, and marketing companies, as well

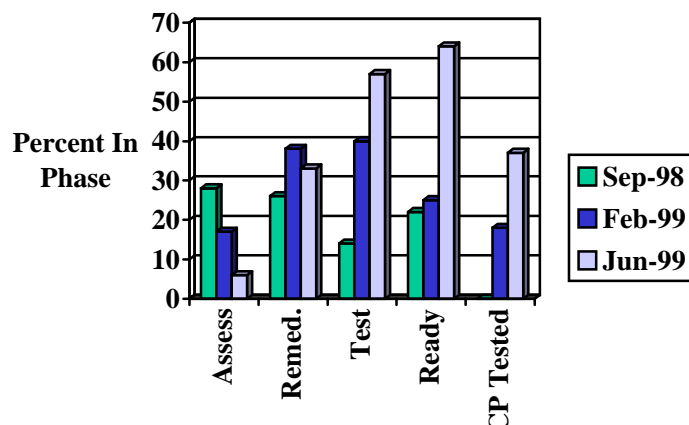
as 181 local natural gas utilities that deliver natural gas to 54 million homes and businesses--has also been actively involved in Y2K. AGA members account for more than 90% of the natural gas delivered domestically. AGA sponsors business television series, joint information technology conferences, and other forums to inform its membership of Y2K solutions.

Status

FERC released its first overall assessment of the Y2K status and preparedness of the gas and oil industry in September 1998, and has issued two updates since that time--in January 1999 and in May 1999. API and AGA, in coordination with the Gas Research Institute and the Interstate Natural Gas Association of America, collected and analyzed surveys of its members to assess the industry's compliance with Y2K requirements. These surveys form the basis for the FERC assessment. Assessment results are shown in Figure 5 for embedded systems.

Oil & Gas Y2K Embedded System Readiness

Figure 5



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The original survey was sent to more than 8,000 gas and oil companies. Only 638, or fewer than 10%, responded. Notwithstanding this low response rate, the fact that most of the 66 big companies responded means that about 66% of total oil and gas consumption was represented in the survey. In later surveys, FERC reported the percentage of consumption rather than the actual number of companies responding to the surveys. The percentage grew to 88% of consumption in the February survey, and to 93% of consumption in the survey released in June 1999. While 93% participation is excellent, it could still mean that more than 1,000 small companies did not participate. This raises concerns for the customers served by these small companies.

Each survey asked companies to indicate the stage their companies were "in," not the stage they had completed. This makes it difficult to determine the true status of the industry. Making matters worse, one of the stages companies could indicate on the survey instrument was "completed or Y2K Ready." but FERC did not report survey results for this category.

When Senator Bennett asked members of the oil and gas working group about this omission in a June 28, 1999, meeting, they indicated that only 20% of the companies reported having their business systems completely Y2K ready. Only 16% of the companies reported that their embedded systems were completely Y2K ready.

Nevertheless, the most recent survey issued in June 1999 indicates that 94% of responding companies estimate they will be ready by September 30, 1999, and all estimate they will be ready by the end of the year. This projection seems unrealistic given the low state of readiness reported to the Committee Chairman in June 1999.

The Committee can only conclude either that many companies are 99% ready and will finish the last 1% of their systems in the next few months, or that many oil and gas companies will not complete Y2K remediation efforts in time.

In light of the late completion dates estimated by many companies, the Committee recommends that significant resources be devoted to contingency planning. This must be stressed because, as shown in Figure 5, fewer than 40% of the companies have actually developed and tested contingency plans.

The Committee remains concerned about the Y2K status of countries from which the U.S. imports oil. About 55% of the oil used in the U.S. comes from foreign sources. Yet, as depicted in Figure 6, many of these countries have a high risk of Y2K disruptions. This risk is based on recent country assessments from a variety of sources, including Global 2000, the World Bank, Cap-Gemini, the State Department, and the Gartner Group, and considers both the Y2K readiness of the oil companies as well as the infrastructure in those countries.

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Indeed, of the top 10 countries from which the U.S. imports oil, three are at high risk for disruption in oil production and transportation; one is at medium risk; three are at low risk (similar to the U.S.); and the status of three are unknown.

Expectations

The oil and gas industry remains a concern. A large number of companies have not participated in industry surveys and, as a result, their Y2K status is unknown. Based on industry status reported by FERC, the Committee questions the claims that all companies will be Y2K ready by the end of the year.

While the Committee is satisfied with the remediation and contingency planning efforts of the large corporations, it believes there may be some disruptions in the small- and medium-sized companies in this sector. It is difficult to predict the impact such disruptions might have on individual homes and other consumers who rely on this industry. Individuals should continue to take charge of their own Y2K preparedness by querying the oil and gas utilities on which they rely.

The Committee also expects that the Y2K-induced disruption in the flow of imported oil may be significant

enough to impact gasoline prices.

DOE does not believe this will be the case, arguing that oil is fungible, and that disruption in one country can be quickly compensated by oil from another country. The

Committee believes that the potential for disruption is significant in enough oil producing countries to impact oil availability and, thus, prices at the gas pump here at home.⁵

The Committee urges the oil industry and the federal government to continue to monitor this situation closely.

Concerns

- The oil and gas sectors remain of concern despite substantial progress since February 1999. Hundreds of production and transportation assets and thousands of miles of pipeline must be checked and repaired. The proliferation of embedded chips and processors throughout the industry's production, transportation, and distribution systems make failure of at least some mission-critical systems possible. The industry must continue its diligent remediation efforts, and focus more on the development and testing of contingency plans.
- The dependence of the gas and oil industry on other sectors—~~electric power and telecommunications~~

Country	Percent U.S. Imports (Jan-May-99)	Risk of Y2K Disruption
Venezuela	14.7	High
Saudi Arabia	14.3	Medium
Canada	13.4	Low
Mexico	12.6	Low
Nigeria	6.6	High
Iraq	4.2	?
Colombia	3.0	High
Angola	2.9	?
United Kingdom	2.9	Low
Virgin Islands	2.9	?
All Others	18.3	?

Figure 6: Oil Import Country Status

cations—adds to the Y2K risk in this sector. Continued close cooperation with these suppliers should be emphasized.

- Public disclosure of information on the Y2K readiness of the oil and gas industry is inadequate. FERC should include the percentage of companies that are Y2K ready in its survey results and, like the NERC report for the electric power industry, should include a list of companies that are Y2K ready.
- While the large gas and oil companies are spending large amounts of money on Y2K remediation, the Committee is concerned about some of the small- and medium-sized companies in this industry, including those up and down the supply chain. These small companies could be the linchpins for the overall success of this industry.
- A more comprehensive Y2K assessment of oil-producing countries is needed to determine the likelihood that U.S. oil imports will be disrupted and, if so, what contingency planning will be needed.

**IN LIGHT OF ALL THE
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REFLECTED IN THE JULY
1999 AMSA SURVEY.**

WATER UTILITIES

Background and Vulnerabilities

The Committee's first report emphasized the overall vulnerability of the water and wastewater industry to Y2K problems. This vulnerability arises primarily from the almost complete reliance on electric power and the widespread use of SCADA systems to monitor critical processes.

It is difficult to say, however, that this vulnerability applies equally to each individual facility since the size, age, and technological complexity of individual water and wastewater systems varies widely throughout the

industry. Neither the size nor the age of a system alone act as good predictors of the degree to which a particular system relies on computer technology for its core functions. While most systems probably rely on computer systems for key business applications such as

billing, the degree to which computer technology is used in the basic operations of water and wastewater treatment, pumping, and delivery varies widely.

These factors, coupled with the enormous size and scope of the industry, make a completely accurate assessment of the water and wastewater industry difficult. A key vulnerability of almost every system, however, is reliance on electric

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power. The fact that this section's assessment of electric utilities is largely positive serves to greatly lessen our overall concern about the Y2K impact on the water and wastewater industry. The industry's concentration on contingency planning over the past year has also served to increase our confidence level. Nonetheless, since the last report the Committee has continued to actively express its concern about the readiness of the water and wastewater industry and to focus on key aspects of the readiness effort that clearly required increased attention.

The results of the July 1999 survey conducted by the Association of Metropolitan Sewerage Agencies (AMSA) paint a portrait of readiness in the wastewater sector that is greatly at odds with the positive assessment we have made about the water and wastewater industry as a whole. The survey showed that only 14 percent of respondents were reporting readiness as of June 1999. The impact that a lack of readiness on the part of wastewater companies could potentially have on its neighboring water treatment facilities could be severe. The Committee is currently making efforts to get further information to better determine the readiness status of wastewater companies.

What is Being Done?

The Committee's prior report referenced an ongoing study that the General Accounting Office (GAO) was conducting at the Committee's request. GAO published the final

results of this study in April 1999.⁶ It rated state drinking water administrations, public water commissions, water pollution control administrations, and public utility wastewater commissions according to how actively engaged they were with the companies they regulated on the Y2K issue. The results indicated a disturbingly low level of involvement on the part of state drinking water administrations and state water pollution control administrations.

Twenty of the 50 state drinking water administrations and 17 water pollution control administrations were rated "inactive" with regard to their outreach activities to the utilities they regulate. Only two drinking water administrations and three water pollution control administrations were rated "proactive." While the public utility commissions (PUCs) for the water and wastewater industries were rated much higher than the state water and wastewater administrations (34 public water commissions and 21 public wastewater commissions were rated "proactive"), the PUCs regulate those companies serving the minority of the drinking water and wastewater customers in the country. State regulatory agencies with authority over drinking water and facilities that serve 58 million people were found to be "inactive." Regulatory agencies with authority over wastewater facilities serving 56 million people were also categorized as "inactive."

While this data is disturbing, it must be emphasized that it does not necessarily reflect the readiness

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status of individual companies. The fact that a firm is located in a state whose regulators were categorized as "inactive" does not necessarily indicate that that firm is unprepared for Y2K. By the same token, however, one cannot assume that a particular company is well-prepared for Y2K simply because it is located in a state whose regulatory agencies were categorized as "proactive." The results of this study were a sure sign to the Committee that more effort was required, and that not everything that could be done was in fact being done.

In response to the GAO data, the Committee sent letters to the Environmental Protection Agency (EPA), the Association of Metropolitan Water Agencies (AMWA), the Association of Metropolitan Sewerage Agencies (AMSA), the American Water Works Association (AWWA), the National Rural Water Association (NRWA), and the National Association of Water Companies (NAWC). The letters highlighted the Committee's concern over the lack of engagement shown by state regulatory agencies and asked the organizations to refocus their efforts on firms located in areas covered by "inactive" state regulatory bodies. The letters also asked EPA and the associations to keep focusing on the "unknowns"--the firms that failed to respond to surveys or had not participated in readiness assessments.

Prior to the formal release of the GAO study, EPA's Office of Water was given a list of the least active state regulatory agencies. EPA subsequently addressed the issue

during a meeting with the Executive Directors of the Association of State Drinking Water Administrators and the Association of State and Interstate Water Pollution Control Administrators. EPA also sent a letter to the Executive Directors asking them to consider advising their members to take appropriate action. Finally, EPA distributed the Committee's letter to its Regional Administrators along with information on states in their regions where there appeared to be no assessment activity.

Some of EPA's other significant actions since the Committee's last report are as follows:

- The Office of Water headquarters staff and Regional Y2K coordinators have assembled and are maintaining a matrix of state and regional Y2K outreach and other activities. This matrix provides significant detail about state activity.
- EPA regions have been meeting with state program officials and staff to provide materials and encourage states to become engaged in the Y2K issue.
- EPA sent a memorandum to Deputy Regional Administrators and Water Division Directors informing them of the Committee's request for additional information about state Y2K actions and assessments of drinking water and wastewater utility readiness.
- The Office of Water sent a Y2K Action Alert direct mailing to smaller utilities in states where

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EPA had no knowledge of direct contact with utilities on the Y2K issue. The mailing included a fact sheet, information about contingency planning, and Web site addresses where additional information is available.

- The Office of Water issued four technical alerts specifying problems that might be experienced with personal computers, embedded chips, contingency planning, and SCADA systems.

EPA also sponsored the "National Readiness Kick-Off," held July 26 through August 6, 1999. The purpose of this initiative was to begin a phase of increased attention to Y2K testing, contingency planning, and public communications by drinking water and wastewater utilities, and to share lessons learned with other utilities. This program was conducted as a partnership between EPA headquarters and regions, the AWWA, the AMSA, the Water Environment Federation, the AMWA, the NAWC, the American Public Works Association, and participating utilities. It was hoped that participating utilities would publicize their Y2K test results in local newspapers, trade press, and on relevant Web sites.

EPA's Web site has posted three detailed case studies prepared for its Office of Water and the State of California. The case studies review the process and status of Y2K preparations of three water and/or wastewater utilities of varying sizes: California's Orange County Sanitation District, El Dorado Irrigation District, and Eastern Municipal Water

District. The case studies include detailed profiles of each utility as to size of geographic area and population served, technical makeup of facilities and plants used, age of infrastructure, departmental budget, and organizational structure.

The case studies are organized around a common reporting format, and provide a good illustration of the difficult challenges facing medium- to large-sized water and wastewater utilities as they prepare for Y2K. The contingency planning section of the studies are well developed. One aspect of the El Dorado Irrigation District's contingency plan illustrates that even dependence on electricity varies within the industry. That district can provide treated drinking water to most of its customers for 5-7 days without electricity, but its sewage lift stations can only function for approximately one-half hour in the absence of electricity before overflowing. It should be noted that the loss of electrical power without backup generation would impact most wastewater facilities in this manner. A unique aspect of the El Dorado Irrigation District's plan is that it takes the social dimension of Y2K into consideration by including a training module on terrorist-initiated disruption at its facility.

Status

In June 1999, the AWWA, the AMWA, and the NAWC conducted their second joint survey on Y2K preparedness in the water industry. The results show significant improvement over their first survey, conducted in August 1998. Of

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614 responses, 92% report they have completed all phases of their Y2K work, including testing. The results were further broken down to reflect readiness by size of the systems, as follows:

- 92% for very large systems (greater than 1,000,001 in the population);
- 88.7% for large systems (100,000 to 1,000,000 in the population);
- 90% for medium systems (10,000 to 100,000 in the population); and
- 93.6% for small systems (less than 10,000 in the population).

By comparison, the 1998 statistics indicated that only 51% of all systems had even completed their assessments, and only 81% believed they would complete their Y2K work by December 31, 1999.

The most recent survey data available on the status of the water industry was provided to the Committee by the AMWA on September 10, 1999. During the last week of August and the first week of September, AMWA polled all 135 of its members and received 118 responses. Altogether, the respondents supply water to approximately 100 million people. AMWA reported the following results:

All of the respondents indicated they are prepared or will be prepared before the Year 2000. Seventy-five percent say they have completed the inventory, assessment, remediation, and replacement phases of their Y2K

preparedness plans. Most of the remaining twenty-five percent will finish in September and October; the few others will finish in December. Ninety-four percent indicate they have special Y2K contingency plans in place, and the remaining six percent will finalize their contingency plans between now and December 1.

In July 1999, the AMSA conducted a follow-up of its October 1998 survey on the Y2K readiness of the wastewater industry. AMSA received responses from 51 of its 250 members. All respondents expect to be completed with the awareness, inventory, and assessment phases by the end of the summer. The breakdown is as follows:

- 94% have completed the awareness phase;
- 82% have finished the inventory phase;
- 67% have completed assessments; and
- 14% are complete with repair, but 100% reported they expect to be complete by this fall.

Additionally, 50 of the 51 respondents reported that they have Y2K contingency plans or are in the process of developing such plans. Respondents cited their back-up power as one of their biggest concerns in developing their contingency plans. In this regard,

- 70% indicated that their contingency plans include calling in

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additional staff during the rollover period;

- 94% plan to use an on-call list for all personnel, and 80% plan to change personnel leave plans during the rollover;
- 82% indicated that their contingency plans address the adequacy of chemical supplies and that their plans include stockpiling if necessary;
- 36% state that their contingency plans include directions to partially or completely shut down processes during the rollover period; and
- 62% stated that manual procedures were part of their contingency plans.

Expectations

The report of the AWWA, AMWA, NAWC survey concludes that water production, treatment, and distribution will proceed without serious interruption due to Y2K. It cautions, however, that this does not mean there will be no interruptions in service. It states clearly that isolated instances of malfunctioning equipment may result in pockets of customers without adequate supply, but that widespread contingency planning will ensure that these interruptions will be limited in scale and of short duration.

While the confidence level of the wastewater industry is very high, the recent AMSA survey data indicating only a 14% completion rate as of

July 1999 is a cause for great concern. There is not enough detail available to determine how close to completion the vast majority of companies are at this point. As of July 1999, the graphic representation for the remaining activities necessary for Y2K remediation before January 1 appears to go almost straight up. It may be possible that only a few minor tasks remain for full completion of Y2K work for many of the companies reporting, but this remains unknown. The statistics seem to indicate quite the opposite—only 67% reported they had completed the assessment stage as of July 1999. Knowing what we know about the complexity of Y2K remediation and the potential for the occurrence of additional unforeseen problems “late in the game,” we feel justified in saying that we are alarmed by these statistics.

Concerns

- In light of all the concentrated effort that has been undertaken, the Committee is surprised by the low level of readiness of the wastewater industry reflected in the July 1999 AMSA survey. A lack of readiness on the part of the wastewater industry can have a devastating impact on the drinking water supply, no matter how well prepared that sector is.
- All of the AMSA survey participants anticipated completion of the repair phase by early fall 1999. This leaves virtually no time left for testing for those not yet done.

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- Another cause of our concern arises solely due to the immensity of the water and wastewater sector. The power industry pales in comparison to the size, scope, and varying degrees of technology that exist within the water and wastewater industry. These factors make it very difficult to offer any broad-brush assessment of the industry.
- The Committee will continue to emphasize the importance of readiness, particularly in the wastewater sector of this industry in what little time remains. We are currently working with the EPA and water and wastewater associations to organize a summit to take action on remaining concerns in this area, and to make further inquiry regarding the current readiness of the wastewater industry.

¹ "Utilities and the National Power Grid," June 12, 1998, S. Hrg. 105-617.

² "Y2K Update on Gas and Electric Utilities," Aug. 4, 1999, S. Hrg. 106-___.

³ These trade associations include the American Petroleum Institute, the Natural Gas Council, the American Gas Association, the American Public Gas Association, the Gas Research Institute, the Interstate Natural Gas Association of America, the Independent Petroleum Association of America, the Association of Oil Pipelines, the Gas Processors Association, the National Gas Supply Association, the Gas Industries Standards Board, the National Petroleum & Refiners Association, the National Propane Gas Association, the Petroleum Marketers Association of America, and the Petroleum Technology Transfer Council.

⁴ "Year 2000 and Oil Imports: Can Y2K Bring Back the Gas Lines?," Apr. 22, 1999, S. Hrg. 105-___.

⁵ See "Anticipating Y2K," Global Commodity Markets, World Bank, July 1999.

⁶ "Year 2000 Computing Crisis—Status of the Water Industry," GAO/AIMD-99-151, April 21, 1999.